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REMARKS

This is a full and timely response to the non-final Official Action mailed October 10, 2006. Reconsideration of the application in light of the following remarks is respectfully requested.

Claim Status:

No amendments are made by the present paper. Therefore, claims 1-47 are currently pending for further action.

35 U.S.C. § 112, First Paragraph:

Claims 1-31, 46 and 47 were rejected in the recent Office Action as not being enabled to one of ordinary skill in the art as required by 35 U.S.C. § 112, first paragraph. Applicant believes that claims 1-31, 46 and 47 are clearly enabled to those of ordinary skill in the art and respectfully traverses this rejection for at least the following reasons.

According to the Office Action, Applicant's "disclosure fails to state or teach one of ordinary skill in the art how to define an axis of volumetric expansion, project a sphere with a center on the axis and define a center of growth of each of the components." (Action of 10/10/06, p. 2). Applicant respectfully disagrees and will address each of these points in turn.

First, defining the axis of volumetric expansion. In most cases, defining the axis of volumetric expansion is easy, as explained in Applicant's specification. "If a component or component assembly is substantially symmetrical about a longitudinal axis, it will generally be advisable to select that axis as the axis of volumetric expansion." (Applicant's specification, paragraph 0018). For most all reasonable applications of Applicant's claimed

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subject matter, this guideline will enable one of skill in the art to identify an axis of volumetric expansion.

When interfacing two components, only one of the components to the interface needs to have an axis of volumetric expansion defined. "The theoretical interface surface may then be used to form a portion of a second component with a complimentary interface." (Applicant's specification, paragraph 0035).

Applicant is not immediately aware of any practical applications of the disclosed technique that could not be addressed by these teachings. Moreover, the Office has not provided any such examples either. If, however, an example were posited in which neither of the components to the interface is symmetrical about a longitudinal axis, Applicant's specification provides the following guidance. The axis of volumetric expansion can be any axis "along which the component (100) will expand and contract." (Applicant's specification, paragraph 0018). The Office Action correctly points out that a "component can expand and contract in multiple directions." (Action of 10/10/06, p. 2). However, there will typically be one axis along which the greatest expansion occurs. One of skill in the art would clearly select this as the axis with respect to which a slippage interface should be designed.

If there is not clearly a major axis of volumetric expansion, the skilled artisan may have to experiment with several candidates axes until the desired "slippage occurs at said interface between said components during volumetric expansion." (Claim 1). Such experimentation would clearly not be undue, especially given the very minimal number of applications, in which such experimentation would appear to be indicated. Moreover, the MPEP makes clear that: "The fact that experimentation may be complex does not necessarily make it undue, if the art typically engages in such experimentation. *In re Certain Limited-Charge Cell Culture Microcarriers*, 221 USPQ 1165, 1174 (Int'l Trade Comm'n 1983), *aff'd*.

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*sub nom., Massachusetts Institute of Technology v. A.B. Fortia*, 774 F.2d 1104, 227 USPQ 428 (Fed. Cir. 1985).” MPEP 2164.01. Consequently, it is unclear how the Office Action can conclude that one of skill in the art could not define an axis of volumetric expansion as claimed.

Next, the Action has alleged that the disclosure fails to state or teach to one of ordinary skill in the art how to project a sphere with a center on the axis of volumetric expansion. (Action of 10/10/06, p. 2). This is clearly an unreasonable position. It is beyond question that one of skill in the art, having defined an axis of volumetric expansion as explained above, could project a sphere and center the sphere on the axis of volumetric expansion.

According to the Action “the diameter of the sphere is unknown.” (*Id.* p. 3). This is clearly incorrect. Applicant’s specification explicitly states that “a good diameter for the sphere would be 1.4 times that of the cylinder or component diameter.” (Applicant’s specification, paragraph 0019). Clearly one of skill in the art can determine the diameter of a component being designed and project a sphere with a diameter 1.4 times that number.

Moreover, with respect to projection of the sphere, the center of the sphere is located at the center of growth. (Applicant’s specification, paragraph 0033). Locating the center of growth is addressed below.

Thus, the specification enables one of skill in the art to define a sphere of a desired diameter and put the center of the sphere on the axis of volumetric expansion. It is unclear how the Office Action can question whether one of skill in the art could project the sphere as claimed.

Lastly, the Action alleges that the disclosure fails to state or teach to one of ordinary skill in the art how to define a center of growth of each of the components. (Action of

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10/10/06, p. 2). In the first place, this is a misstatement of what Applicant claims. Applicant does not recite that a center of growth is or must be defined for *each* of the components. Rather, only a single center of growth need be defined.

According to Applicant's specification, "the center of growth (130) is the intersection of the lines drawn along interfaces between the components, i.e., the seals (210,220), nut (250), hub (230) and post (240)." (Applicant's specification, paragraph 0026). Stated more generally, the "center of growth (120) is also a point that will be at the intersection of two or more planes which each include a portion of one or more interface surfaces between components." (Applicant's specification, paragraph 0020). Thus, by looking at the component surfaces that need to be interfaced, one of skill in the art finds a center of growth from which, using Applicant's technique, an optimal shape for those interfaces can then be determined.

Moreover, in some embodiments, the center of the sphere is "centered with respect to the component (100) or component assembly." (Applicant's specification, paragraph 0019). In such cases, "[t]he center of the sphere (130) [also] defines a center of growth (120)." (Applicant's specification, paragraph 0020). Thus, the specification provides this alternative technique for locating the center of growth based on the geometry of the component or component assembly.

Thus, it is again unclear how the Office Action can question whether one of skill in the art could locate the center of growth as claimed. It would appear that the Office Action drastically underestimates the level of ordinary skill in the art.

Applicant also wishes to note that the specification provides not just one, but four examples of the techniques described and claimed. Fig. 1 and the accompany text describes and illustrate the claimed technique with respect to a cylindrical component. Fig. 2A and 2B

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and the accompany text describe and illustrate the claimed technique with respect to a fuel cell pass through. Fig. 4 illustrates a ceramic retention component assembly formed according to the claimed technique. Fig. 5 illustrates an SOFC stack with sealing interfaces formed according to the claimed technique.

MPEP 2164.02, "Working Example," explains that the existence of even one working example in the application casts doubt on whether a lack of enablement issue can be raised and shifts the burden to the examiner to explain "why one would not expect to be able to extrapolate that one example across the entire scope of the claims." Applicant has provided, not just one, but four working examples.

In conclusion, the burden is initially upon the examiner to establish a reasonable basis for questioning the sufficiency of the disclosure. *In re Strahilevitz*, 668 F. 2d 1229, 212 USPQ 561 (CCPA 1982). In the present case, the examiner has clearly not established any reasonable basis for questioning the sufficiency of the disclosure. Therefore, for at least the foregoing reasons, the rejection based on 35 U.S.C. § 112, first paragraph, is inappropriate and should be reconsidered and withdrawn.

35 U.S.C. § 112, First Paragraph:

The Office Action rejected claims 46 and 47 under 35 U.S.C. § 112, second paragraph, with the following explanation. Claims 46 and 47 are allegedly indefinite because it "is unclear how a shear plane is formed with reference to a center of growth that is indefinite." (Action of 10/10/06, p. 3).

Consequently, it appears that this rejection is misplaced under § 112, second paragraph, and is merely an extension or restatement of the enablement rejection addressed above. Given the foregoing explanation as to how one of skill in the art can locate a center of

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growth, there appears to be nothing indefinite about the recitation in claims 46 and 47 of a shear plane formed with reference to that center of growth. Therefore, the rejection under 35 U.S.C. § 112, second paragraph, is also inappropriate and should be reconsidered and withdrawn.

Prior Art:

Claims 32-44 were rejected as anticipated under 35 U.S.C. § 102(e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious in view of U.S. Patent App. Pub. No. 2002/0142204 to Prediger et al. ("Prediger"). For at least the following reasons, these rejections are respectfully traversed.

Claim 32 recites: "An assembly having least one interface between components having different rates of volumetric expansion, said interface being formed with an interface surface that is formed with respect to a center of growth such that slippage occurs at said interface between said components during volumetric expansion." In contrast, Prediger fails to teach or suggest the claimed assembly "with an interface surface that is formed with respect to a center of growth such that slippage occurs at said interface" during volumetric expansion.

In this regard, the Office Action cites Prediger at paragraph 0028. (Action of 10/10/06, p. 4). In pertinent part, this section of Prediger merely discusses a fuel cell electrolyte.

Ceramic electrolyte (18) is surrounded by a frame seal (20) that holds the element (18) in place and also provided a sealing means such that the gases flowing through flow fields (16) do not escape those fields into other regions of the cell or into the atmosphere. It is important to hold ceramic electrolyte (18) firmly in place, since the electrolyte is comprised of a brittle cermet and is sensitive to shock and vibration. Electrolyte (18) is further held in place through the presence of a porous, electrically conductive, compressible element (22), such as nickel foam, which is compressed

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against the next interconnect plate (24) in sequence when the stack is assembled. Thus the ceramic electrolyte (18) is restrained from movement in all three axes. (Prediger, paragraph 0028).

There is clearly no teaching or suggestion here of the claimed assembly "with an interface surface that is formed with respect to a center of growth such that slippage occurs at said interface" during volumetric expansion. As explained in Applicant's specification, an interface surface formed according to Applicant's technique is physically and structurally different from an interface formed by some other method in that the structure of the interface formed as claimed provides improved slippage at the interface during volumetric expansion. In contrast, Prediger clearly fails to teach or suggest this claimed interface.

Prediger, as cited, does not describe any slippage that occurs at an interface during volumetric expansion. Thus, it is entirely unclear how the Office Action could consider Prediger relevant to claim 32. Moreover, Prediger clearly does not teach or suggest the claimed assembly "with an interface surface that is formed with respect to a center of growth such that slippage occurs at said interface" during volumetric expansion. Consequently, there is absolutely nothing in Prediger that would anticipate or render obvious the subject matter of claim 32. Thus, the Office Action has failed to make out a *prima facie* case of either anticipation or obviousness with respect to claim 32.

"A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. "To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." M.P.E.P. § 2143.03. Accord.

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M.P.E.P. § 706.02(j). Since Prediger fails to meet either of these standards, the rejection based on Prediger should be immediately reconsidered and withdrawn.

Additionally, the various dependent claims of the application recite subject matter that is further patentable over the prior art of record. Specific, non-exclusive examples follow.

Claim 33 recites: "wherein said interface is further formed by: defining an axis of volumetric expansion for a first component; projecting a sphere with a center on said axis; an defining the center of said sphere as said center of growth." In contrast, Prediger utterly fails to teach or suggest this subject matter and the Office Action fails to indicate how or where Prediger teaches this subject matter.

It is interesting to note, however, that this appears to be the same subject matter which the Office Action held was non-enabled with respect to claim 1. It is logically inconsistent to argue that subject matter is not enabled to one of skill in the art, but is fully taught by a cited prior art reference. In reality, the subject matter is enabled and is not taught or suggested by Prediger.

Claim 34 recites:

wherein said interface is further formed by:  
projecting a perimeter of said first component onto said sphere to define a projection line; and  
forming said interface surface based on a plurality of planes each of which includes said center of growth, a point on said projection line and a tangent to that point on said projection line.

In contrast, Prediger utterly fails to teach or suggest this subject matter and the Office Action fails to indicate how or where Prediger teaches this subject matter.

Claim 35 recites "wherein said forming said interface surface further comprises forming said interface surface tangent to all of said planes in said plurality of planes." In



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contrast, Prediger utterly fails to teach or suggest this subject matter and the Office Action fails to indicate how or where Prediger teaches this subject matter.

Claim 45 was rejected as being unpatentable under 35 U.S.C. § 103(a) over the teachings of Prediger and U.S. Patent No. 5,799,951 to Anderson et al. ("Anderson"). This rejection is respectfully traversed for at least the same reasons as given above with respect to independent claim 32.

Conclusion:

For the foregoing reasons, the present application is thought to be clearly in condition for allowance. Accordingly, favorable reconsideration of the application in light of these remarks is courteously solicited. If the Examiner has any comments or suggestions which could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the number listed below.

Respectfully submitted,

DATE: January 10, 2007



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